

**Introduction to Geotechnology**  
**GEOG 210R/GEOL 210R**  
**Fall 2009 Syllabus (M 5:30-7:00pm) SEM 234**

**Instructor:** Dr. Scott D. Bassett

**Bassett Office:** Mackey Science 223

**Bassett Office Hours:** Monday 9:00am-10:30am or by appointment

**Phone:** 784-1434

**E-mail:** [sbassett@unr.edu](mailto:sbassett@unr.edu)

**Lab:** All Labs will be held in MS222 and at the time for your section

**Teaching Assistants (Lab):** Sean Pries and Matt Van den Berg

**Teaching Assistant Office:** Mackey Science 220

**Teaching Assistant Office Hours:** Sean, Tues, 3:30-5:00pm; Matt Wed. 2:30-4:00.

**E-mail:** Sean-[priess2@unr.nevada.edu](mailto:priess2@unr.nevada.edu) and Matt-[vmatthew@unr.nevada.edu](mailto:vmatthew@unr.nevada.edu)

**Course Description:** Geotechnology, as a term, describes the technological advances used to describe, assimilate, or analyze spatial information. Emphasis within the course is on Geographic Information Systems with discussions into Global Positioning Systems and remotely sensed imagery. Cartographic principles are introduced to aid in the creation of digital maps. The importation of various datasets is described highlighting how a variety of data sources may be used for analysis of spatial features. Laboratory assignments will demonstrate real-world applications derived from the lectures using Arc/GIS desktop.

**Course Goals:**

Goal 1. Provide a general understanding of what geotechnology exists.

Goal 2. Familiarize students with GIS software and how remotely sensed imagery and GPS data points may be incorporated therein.

Goal 3. Prepare students for taking more advanced courses within Geography that emphasize GIS, GPS and remote sensing applications.

**Required Text:**

None, but readings will be assigned one week prior to the lecture and may be accessed through WebCampus (<http://webct.unr.edu>). You may log in using your UNR NetID. If you do not have an active UNR NetID please activate before the next class

(<http://www.it.unr.edu/getstarted/aboutnetid.asp>).

**Additional Readings:**

Monmonier, M. 1996. Chapter 2 and Chapter 3. Elements of a Map in *How to Lie with Maps*, 2<sup>nd</sup> edition. The University of Chicago Press, Chicago, IL.

Jenson, S. K. and J. O. Domingue. 1988. Extracting Topographic Structure from Digital Elevation Data for Geographic Information System Analysis. *Photogrammetric Engineering and Remote Sensing*. Vol. 54, No. 11, November 1988, pp. 1593-1600.

**Exams and Labs:**

Three exams will be prepared to test individual student knowledge on the material presented in class and contained within the required readings. All exams will be worth 100 points each. Ten laboratory experiences will be provided to the students. Laboratory assignments will be made at the beginning of the assigned lab time. Laboratory assignments will be due within one week of the assigned date and may be worked on during the allotted lab time or at any open lab time. Any computer lab with Arc/GIS desktop readily available may be used to complete lab assignments. Currently, three labs are known to offer Arc/GIS (LMR 335, MS 222, and MS 221).

Exam/Assignments	Undergrad (%)
Exam 1	100 (25%)
Final Exam	100 (25%)
Labs (10 labs 20 points each)	200 (50%)
<b>Total</b>	<b>400 (100%)</b>

**Grades:**

93-100% (4.0)	= A	90-92.9% (3.7)	= A-
87-89.9 (3.3)	= B+	83-86.9 (3.0)	= B
80-82.9 (2.7)	= B-	77-79.9 (2.3)	= C+
73-76.9 (2.0)	= C	70-73.9 (1.7)	= C-
67-69.9 (1.3)	= D+	63-66.9 (1.0)	= D
60-63.9 (0.7)	= D-	Below 60 (0.0)	= F

**Lecture Attendance Policy:** All students must attend class. The instructor and teaching assistant are not responsible for describing unfamiliar classroom material to students who selectively do not attend class.

**Lab Assignments:** Lab Assignments are due at the start of your lab time during the week noted in the schedule below. Late lab assignments will be marked down at a rate of 10% of the grade per day.

**Tardiness:** Please be on time. Coming late or leaving early is a sign of disrespect, and it disturbs everybody in the classroom. If you intend on leaving class early please let me know at the start of class so I expect it.

**Digital Devices:** No digital devices are admitted in class. Therefore, during lecture time you cannot (1) use a cell phone-if you must have your phone on to wait for a call and it comes in, please quietly pick up your stuff and leave the room to answer, (2) tap on your laptop, and (3) listen to music-remove those earpieces before entering the class.

**Cheating (i.e. direct copying of work):** Cheating is unacceptable and if done will result in the student receiving an F for the course. Collaboration among students is encouraged, however, all written work must be in the students own words.

**Disability:** If you have a disability and will be requiring assistance, please contact the instructor or the Disability Resource Center (Thompson Building Suite 101) as soon as possible to arrange for appropriate accommodations.

## Introduction to Geotechnology (GEOG/GEOL 210R)

<b>Week 1</b> <b>Aug 24</b>	<b>Lecture:</b> Introduction to what Geotechnology is <b>Goals:</b> Familiarize all with the concepts of Map Elements, Cartography, GIS, GPS and Remote Sensing <b>Readings:</b> None	<b>Lab:</b> No Lab
<b>Week 2</b> <b>Aug 31</b>	<b>Lecture:</b> Data acquisition and Computer Cartography <b>Goals:</b> To understand the components of a map and where data may be accessed <b>Readings:</b> Monmonier Chapter 3	<b>Lab:</b> Introduction to Lab, Software Familiarization, and Map Layout (Lab Assignment 1 assigned)
<b>Week 3</b> <b>Sept 7</b>	<b>Lecture:</b> None <b>Goals:</b> Enjoy Labor Day <b>Readings:</b> None	<b>Lab:</b> No Lab
<b>Week 4</b> <b>Sept 14</b>	<b>Lecture:</b> Coordinate Systems and Map Projections <b>Goals:</b> Glean a general understanding of how a spherical world may be represented <b>Readings:</b> Monmonier Chapter 2	<b>Lab:</b> Map Projections (Lab Assignment 2 assigned: Lab 1 due)
<b>Week 5</b> <b>Sept 21</b>	<b>Lecture:</b> Datums, Spheroids, and Scale <b>Goals:</b> Familiarize students with the concept of scale and with map projections and their use. <b>Readings:</b> Campbell Chapter 4	<b>Lab:</b> Field use of GPS Units (Lab Assignment 3 assigned: Lab 2 due)
<b>Week 6</b> <b>Sept 28</b>	<b>Lecture:</b> GPS <b>Goals:</b> Become fluent in the field use of simple GPS systems. <b>Readings:</b> Thurston et al. Chapter 5	<b>Lab:</b> No Lab, but can make up GPS Lab 3 if coordinated with the TA
<b>Week 7</b> <b>Oct 5</b>	<b>Lecture:</b> Database and spreadsheets <b>Goals:</b> Gain the capability to import GPS points and generate GIS layers <b>Readings:</b> Demmers Chapter 4	<b>Lab:</b> GPS coordinate importation and GIS (Lab Assignment 4 continued)
<b>Week 8</b> <b>Oct 12</b>	<b>Lecture:</b> Remote Sensing: Land observation satellites, LIDAR, Microwave <b>Goals:</b> Become familiar with the use of satellite imagery <b>Readings:</b> Campbell Chapters 1 and 2	<b>Lab:</b> Satellite imagery use and overlays (Lab Assignment 5 assigned: Lab 4 due)
<b>Week 9</b> <b>Oct 19</b>	<b>Lecture:</b> Exam 1 <b>Goals:</b> Test comprehension of material <b>Readings:</b> None	<b>Lab:</b> No Lab
<b>Week 10</b> <b>Oct 26</b>	<b>Lecture:</b> Vector GIS Analysis (Topology) <b>Goals:</b> Understand the relationship between points, lines, polygons, and regions along with some simple overlay analyses. <b>Readings:</b> TBD	<b>Lab:</b> Vector Analysis: The Basics (Lab Assignment 6 assigned: Lab 5 due)
<b>Week 11</b> <b>Nov 2</b>	<b>Lecture:</b> Vector GIS Analysis (Data Management and File Formats) <b>Goals:</b> Gain the capability to do simple vector based GIS analyses <b>Readings:</b> TBD	<b>Lab:</b> Vector Analysis 2: File Conversion and Analysis (Lab Assignment 7 assigned: Lab 6 due)
<b>Week 12</b> <b>Nov 9</b>	<b>Lecture:</b> Raster GIS Analysis <b>Goals:</b> Gain the capability to do simple raster based GIS analyses using Spatial Analyst <b>Readings:</b> TBD	<b>Lab:</b> Raster Analysis: Extraction, Map Algebra, and Generalization (Lab Assignment 8 assigned: Lab 7 due)
<b>Week 13</b> <b>Nov 16</b>	<b>Lecture:</b> Raster GIS Analysis (Surface and Hydrologic analyses) <b>Goals:</b> Become familiar with the use of digital	<b>Lab:</b> Raster Analysis 2: Surface and Hydrologic functions (Lab Assignment 9 assigned:

	elevation models and their derivative products <b>Readings:</b> Jenson S. K. and J. O. Domingue 1988	Lab 8 due)
<b>Week 14</b> <b>Nov 23</b>	<b>Lecture:</b> Geotechnology applications to natural resources management <b>Goals:</b> Familiarize all with natural resource applications <b>Readings:</b> TBD	<b>Lab:</b> No Lab
<b>Week 15</b> <b>Nov 30</b>	<b>Lecture:</b> Geotechnology applications in the built environment <b>Goals:</b> Familiarize all with built environment applications <b>Readings:</b> TBD	<b>Lab:</b> Prediction of Wildlife Habitat (Lab Assignment 10 assigned: Lab 9 due)
<b>Week 16</b> <b>Dec 7</b>	<b>Lecture:</b> Finals Week (Final is Comprehensive) Final will be on Friday Dec. 11 <sup>th</sup> 4:30pm	<b>Lab:</b> Lab Assignment 10 due in class on Dec 7 <sup>th</sup> . No Lab